Jiawei Zhang

Department of Automation, Tsinghua University
E-mail: zhangjw16@tsinghua.org.cn ◇ Homepage: Jiawei Zhang, Google Scholar

EDUCATION

Tsinghua University *September 2020 - June 2025*
Department of Automation (Graduate with honor)
Ph.D in Control Science and Engineering

Tsinghua University *September 2016 - June 2020*
Department of Automation
B.S. of Engineering (Graduate with honor)

AREAS OF INTERESTS

Research Interests Artificial intelligence, Deep reinforcement learning, Intelligent decision-making, Intelligent system, Intelligent scheduling, Autonomous driving

RESEARCH PUBLICATION

1. **Jiawei Zhang**, Zhiheng Li, Li Li, Yidong Li, Hairong Dong. A bi-level cooperative operation approach for AGV based automated valet parking[J]. Transportation Research Part C: Emerging Technologies, 2021, 128: 103140. (SCI Index, IDS Number: ST9YR, IF: 7.6)

2. **Jiawei Zhang**, Huaxin Pei, Xuegang (Jeff) Ban, Li Li. Analysis of cooperative driving strategies at road network level with macroscopic fundamental diagram[J]. Transportation Research Part C: Emerging Technologies, 2022, 135: 103503. (SCI Index, IDS Number: 0I8XY, IF: 7.6)

3. **Jiawei Zhang**, Cheng Chang, Xianlin Zeng, Li Li. Multi-agent DRL-based lane change with right-of-way collaboration awareness[J]. IEEE Transactions on Intelligent Transportation Systems, 2022, 24(1): 854-869. (SCI Index, IDS Number: 8R6MD, IF: 7.9)

4. **Jiawei Zhang**, Shen Li, Li Li. Coordinating CAV swarms at intersections with a deep learning model[J]. IEEE Transactions on Intelligent Transportation Systems, 2023, 24(6): 6280-6291. (SCI Index, IDS Number: I5VY0, IF: 7.9)

5. **Jiawei Zhang**, Cheng Chang, Zimin He, Wenqin Zhong, Danya Yao, Shen Li, Li Li. CAVSim: A microscopic traffic simulator for evaluation of connected and automated vehicles[J]. IEEE Transactions on Intelligent Transportation Systems, 2023, 24(9): 10038-10054. (SCI Index, IDS Number: GK9T4, IF: 7.9)

6. **Jiawei Zhang**, Jingwei Ge, Shu Li, Shen Li, Li Li. A bi-level network-wide cooperative driving approach including deep reinforcement learning-based routing[J]. IEEE Transactions on Intelligent Vehicles, 2024, 9(1): 1243-1259. (SCI Index, IDS Number: JL4V0, IF: 14.0)

7. **Jiawei Zhang**, Cheng Chang, Shen Li, Xuegang (Jeff) Ban, Li Li. Unleashing the two-dimensional benefits of connected and automated vehicles via dedicated intersections in mixed traffic[J]. Transportation Research Part C: Emerging Technologies, 2024, 160: 104501. (SCI Index, IDS Number: LM3N9, IF: 7.6)

8. **Jiawei Zhang**, Qiyuan Liu, Shen Li, Li Li. Unleashing the power of connected and automated vehicles: a dedicated link strategy for efficient management of mixed traffic[J]. IEEE Transactions on Intelligent Transportation Systems, 2024, 25(9): 12315-12332. (SCI Index, IDS Number: J9L9G, IF: 7.9)

9. **Jiawei Zhang**, Cheng Chang, Huaxin Pei, Xinyu Peng, Yuqing Guo, Renzong Lian, Zhenwu Chen, Li Li. CAVSim: A microscope traffic simulator for connected and automated vehicles environment[C]//2022 IEEE 25th International Conference on Intelligent Transportation Systems (ITSC). IEEE, 2022: 3719-3724. (EI Index, Number: 20224613130523)

10. Xinyu Peng, **Jiawei Zhang**, Fei-Yue Wang, Li Li. Drill the cork of information bottleneck by inputting the most important data[J]. IEEE Transactions on Neural Networks and Learning Systems, 2021, 33(11): 6360-6372. (SCI Index, IDS Number: 5T7PZ, IF: 10.2)

11. Huaxin Pei, **Jiawei Zhang**, Yi Zhang, Xin Pei, Shuo Feng, Li Li. Fault-tolerant cooperative driving at signal-free intersections[J]. IEEE Transactions on Intelligent Vehicles, 2022, 8(1): 121-134. (SCI Index, IDS Number: D0SM2, IF: 14.0)

12. Qiyuan Liu, **Jiawei Zhang**, Wenqin Zhong, Zhiheng Li, Xuegang (Jeff) Ban, Shen Li, Li Li. Fault-tolerant cooperative driving at highway on-ramps considering communication failure[J]. Transportation Research Part C: Emerging Technologies, 2023, 153: 104227. (SCI Index, IDS Number: DM4S9, IF: 7.6)

13. Cheng Chang, **Jiawei Zhang**, Kunpeng Zhang, Wenqin Zhong, Xinyu Peng, Shen Li, Li Li. BEV-V2X: Cooperative birds-eye-view fusion and grid occupancy prediction via V2X-based data sharing[J]. IEEE Transactions on Intelligent Vehicles, 2023, 8(11): 4498-4514. (SCI Index, IDS Number: CX0T8, IF: 14.0)

14. Huaxin Pei, **Jiawei Zhang**, Yi Zhang, Huile Xu, Li Li. Self-organized routing for autonomous vehicles via deep reinforcement learning[J]. IEEE Transactions on Vehicular Technology, 2023, 73(1): 426-437. (SCI Index, IDS Number: IM7R3, IF: 6.1)

15. Shen Li, **Jiawei Zhang**, Zhenwu Chen, Li Li. Theoretical analysis of cooperative driving at idealized unsignalized intersections[J]. Tsinghua Science and Technology, 2023, 29(1): 257-270. (SCI Index, IDS Number: S9NJ3, IF: 5.2)

16. Jingwei Ge, **Jiawei Zhang**, Cheng Chang, Yi Zhang, Danya Yao, Li Li. Task-driven controllable scenario generation framework based on AOG[J]. IEEE Transactions on Intelligent Transportation Systems, 2024, 25(6): 6186-6199. (SCI Index, IDS Number: SW8V8, IF: 7.9)

17. Cheng Chang, **Jiawei Zhang**, Jingwei Ge, Zuo Zhang, Junqing Wei, Li Li. VistaScenario: Interaction scenario engineering for vehicles with intelligent systems for transport automation[J]. IEEE Transactions on Intelligent Vehicles, 2024. (SCI Index, IF: 14.0)

18. Jingwei Ge, **Jiawei Zhang**, Cheng Chang, Yi Zhang, Danya Yao, Yonglin Tian, Li Li. Dynamic testing for autonomous vehicles using random Quasi Monte Carlo[J]. IEEE Transactions on Intelligent Vehicles, 2024, 9(3): 4480-4492. (SCI Index, IDS Number: PM6W4, IF: 14.0)

19. Cheng Chang, **Jiawei Zhang**, Kunpeng Zhang, Yichen Zheng, Mengkai Shi, Jianming Hu, Shen Li, Li Li. CAV driving safety monitoring and warning via V2X-based edge computing system[J]. Frontiers of Engineering Management, 2024, 11(1): 107-127. (SCI Index, IDS Number: LI9F0, IF: 9.1)

20. Qiyuan Liu, **Jiawei Zhang**, Jingwei Ge, Cheng Chang, Zhiheng Li, Shen Li, Li Li. Integrating spatial-temporal risk maps with candidate trajectory trees for explainable autonomous driving planning[J]. Communications in Transportation Research, 2025, 6: 100161. (SCI Index, IDS Number: U7J2Q, IF: 12.5)

21. Jingwei Ge, **Jiawei Zhang**, Yi Zhang, Danya Yao, Zuo Zhang, Rui Zhou. Autonomous vehicles testing considering utility-based operable tasks[J]. Tsinghua Science and Technology, 2023, 28(5): 965-975. (SCI Index, IDS Number: R2CG7, IF: 5.2)

22. Cheng Chang, Siqi Wang, **Jiawei Zhang**, Jingwei Ge, Li Li. LLMScenario: large language model driven scenario generation[J]. IEEE Transactions on Systems, Man, and Cybernetics: Systems, 2024, 54(11): 6581-6594. (SCI Index, IDS Number: RF2F0, IF: 8.6)

23. Jingwei Ge, Cheng Chang, **Jiawei Zhang**, Lingxi Li, Xiaoxiang Na, Yilun Lin, Li Li, Fei-Yue Wang. LLM-based operating systems for automated vehicles: A new perspective[J]. IEEE Transactions on Intelligent Vehicles, 2024, 9(4): 4563-4567. (SCI Index, IDS Number: US4Q9, IF: 14.0)

24. Jingwei Ge, Huile Xu, **Jiawei Zhang**, Yi Zhang, Danya Yao, Li Li. Heterogeneous driver modeling and corner scenarios sampling for automated vehicles testing[J]. Journal of Advanced Transportation, 2022, 2022(1): 8655514. (SCI Index, IDS Number: 1S3JD, IF: 2.0)

25. Cheng Chang, Kunpeng Zhang, **Jiawei Zhang**, Shen Li, Li Li. Driving safety monitoring and warning for connected and automated vehicles via edge computing[C]//2022 IEEE 25th International Conference on Intelligent

Transportation Systems (ITSC). IEEE, 2022: 3940-3947. (EI Index, Number: 20224613130578)

26. Renzong Lian, Zhiheng Li, Boxuan Wen, Junqing Wei, **Jiawei Zhang**, Li Li. Predictive information multiagent deep reinforcement learning for automated truck platooning control[J]. IEEE Intelligent Transportation Systems Magazine, 2023, 16(1): 116-131. (SCI Index, IDS Number: FC5T7, IF:4.3)
27. Zimin He, **Jiawei Zhang**, Huaxin Pei, Liang Feng, Danya Yao. Communication fault-tolerant cooperative driving at on-ramps: a global planning and local gaming strategy[C]//2024 IEEE Intelligent Vehicles Symposium (IV). IEEE, 2024: 1165-1170. (EI Index, Number: 20243116784742)
28. Zimin He, **Jiawei Zhang**, Danya Yao, Yi Zhang, Huaxin Pei. Adversarial generation of safety-critical lane-change scenarios for autonomous vehicles[C]//2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC). IEEE, 2023: 6096-6101. (EI Index, Number: 20241015674032)

PATENT

1. Li Li, **Jiawei Zhang**, Cheng Chang, Xinyu Peng. Methods and apparatus for training a scheduling model, and methods and apparatus for implementing cooperative driving: China, ZL202210187529.3 (Chinese Patent Authorization Number), 2022.
2. Li Li, **Jiawei Zhang**, Cheng Chang, Shen Li, Yi Zhang. Deep reinforcement learning based route planning method, apparatus, and vehicle: China, ZL202310341466.7(Chinese Patent Authorization Number), 2023.
3. Li Li, Cheng Chang, **Jiawei Zhang**, Yuqing Guo, Zhiheng Li. Data storage apparatus for cooperative driving, data processing method, and roadside equipment: China, ZL202210059862.6(Chinese Patent Authorization Number), 2022.
4. Li Li, **Jiawei Zhang**, Qiyuan Liu, Shen Li, Zhiheng Li. An intersection management method and apparatus under mixed traffic environment: China, CN202310845829.0(Chinese Patent Application Number), 2023.
5. Li Li, Shen Li, **Jiawei Zhang**, Cheng Chang, Zhiheng Li. Vehicle adaptive cooperative driving method, apparatus and roadside equipment at signal-free intersections: China, CN202310308266.1(Chinese Patent Application Number), 2023.
6. Li Li, Cheng Chang, **Jiawei Zhang**, Jingwei Ge, Pengbo Wang. A driving scenario generation method and system based on large language model: China, CN202410794745.3(Chinese Patent Application Number), 2024.
7. Li Li, Cheng Chang, **Jiawei Zhang**, Jingwei Ge, Pengbo Wang. A driving scenario classification and annotation method and apparatus based on vehicle interaction: China, CN202410914027.5(Chinese Patent Application Number), 2024.

HONORS & AWARDS

- Outstanding Graduate of Beijing *2025*
- Outstanding Graduate of Tsinghua *2025*
- Excellent Doctoral Dissertation Award of Tsinghua *2025*
- National Scholarship (Ph.D) *2023*
- Tsinghua University Graduates Sailing Award *2025*
- Outstanding Graduate Student (BEIJING ASSOCIATION OF AUTOMATION) *2022*
- Tsinghua University Zheng-Weimin Scholarship *2025*
- Excellent Comprehensive Scholarship of Tsinghua University *2024*
- Academic Excellence Award (Institute of System Engineering, THU) *2023*
- Excellent Comprehensive Scholarship of Tsinghua University (Tsinghua-Xuancheng Scholarship) *2022*
- Best Student Paper Award (IEEE ITSC 2022) *2022*

- Excellent Comprehensive Scholarship of Tsinghua University (Tsinghua-Weihai Scholarship) *2021*
- Outstanding Graduates of Dept. Automation *2020*
- National Encouragement Scholarship *2019*
- HAGE Encouragement Scholarship *2018*
- National Encouragement Scholarship *2018*
- HAGE Encouragement Scholarship *2017*
- National Encouragement Scholarship *2017*
- The Top Scorer of Science in Wuwei City *2016*

TECHNICAL STRENGTHS

Computer Languages C++/C, Python, MATLAB
Deep Learning Framework Pytorch, Tensorflow, Keras

OTHERS

Reviewer Service IEEE Transactions on Intelligent Transportation Systems, Transportation Research Part C-Emerging Technologies, IEEE Transactions on Intelligent Vehicles, EEE Transactions on Automation Science and Engineering, IEEE Antennas and Wireless Propagation Letters, International Journal of Human-Computer Interaction, IEEE Transactions on Vehicular Technology, IEEE International Conference on Intelligent Transportation Systems 2022/2023, China Automation Conference 2022/2023, et al.

Teaching Assistant Convex Optimization (2020-2021; 2021-2022; 2023-2024)

Blue Book Annual Report On The Development Of Autonomous Driving Industry In China (2020)